DOCUMENT RESUME

ED 345 760 JC 920 214

AUTHOR	Cooper, James L.; And Others
TITLE	Cooperative/Collaborative Learning: Research and Practice (Primarily) at the Collegiate Level, Parts I and II.
PUB DATE	91
NOTE	22p.
AVAILABLE FROM	New Forums Press, Inc., P.O. Box 876, Stillwater, OK 74076.
PUB TYPE	Reference Materials - Bibliographies (131) -- Journal Articles (080)
JOURNAL CIT	Journal of Staff, Program, & Organization Development; v7 n3 p143-148 Fall 1989 v9 n4 p239-252 Win 1991
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Annotated Bibliographies; *Classroom Techniques; *Cooperative Learning; *Educational Research; Group Activities; Higher Education; Learning Strategies; *Small Group Instruction; Student Participation; *Teaching Methods; Undergraduate Study

ABSTRACT

Cooperative learning may be defined as a structured, systematic instructional strategy in which small groups work together toward a common goal. It differs from collaborative learning in its emphasis on highly structured techniques for ensuring positive interdependence within groups and its insistence on individual accountability rather than undifferentiated group grading. This two-part bibliography provides 101 annotations of books and articles on cooperative and collaborative learning research and practice. Both parts of the bibliography are divided into two major sections containing applied and research/theoretical works. Part I focuses on works published prior to 1989, while part II emphasizes works appearing in 1990-91. Part II also provides a brief introduction which charts the growing interest in cooperative learning among higher education practitioners and defines cooperative learning in contrast to other approaches. Some works on collaborative learning and other forms of small group work in higher education are also included. (JSP)

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Cooperative/Collaborative Learning: Research and Practice (Primarily) at the Collegiate Level, Part I and II. Volume 7, Number 3, Fall 1989 and Volume 9, Number 4, Winter 1991.

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The Journal of Staff, Program, & Organization Development;
v7, n3, p143-148, fall 1989; v9, n4, p239-252, win 1991.

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Cooperative/Collaborative Learning: Research and Practice (Primarily) at the Collegiate Level

Suggested readings dealing with applied work and research work in Cooperative/Collaborative Learning at the college level.

By James L. Cooper and Randall Mueck

Abercrombie, M.L.J. (1974). *Aims and techniques of group teaching.* London: Society for Research into Higher Education Ltd.

A short book describing a variety of small group techniques, including syndicate learning, peer tutoring and associative group discussions. Emphasis is on work conducted in Britain. Abercrombie's work on Collaborative Learning with medical students at the University of London is considered by Kenneth Bruffee and others as seminal.

Billson, J.M. (1986). The college classroom as a small group: Some implications for teaching and learning. *Teaching Sociology, 14,* 143-151.

A discussion of 15 principles concerning effective implementation of Collaborative Learning in the college classroom. Literature on group processes and development brought to bear on the subject in a very practical way.

Bishop, W. (1988). Helping peer writing groups succeed. *Teaching English in the Two Year College, 15,* 120-125.

A short, practical paper detailing issues to be considered in setting up peer writing groups in college composition classes. Useful for anyone setting up Collaborative Learning in any discipline.

Bohlmeyer, E.M., & Burke, J.P. (1987). Selecting cooperative learning techniques: A consultative strategy guide. *School Psychology Review, 16,* 36-49.

Although focusing on K-12 applications, this article is highly recommended for teachers at the collegiate level as well. A number of Cooperative Learning techniques are described and assessed in terms of a variety of categories, including type of knowledge to be fostered, ease of implementation and method of assigning students to learning teams.

Bouton, C., & Garth, R. (Eds.). (1983). *Learning in groups.* San Francisco: Jossey-Bass.

A text in which a number of different chapter authors describe research and practice in Collaborative Learning. A good overview concerning how Collaborative Learning can be applied in a variety of college disciplines. Recommended for the new practitioner and those already implementing collaborative techniques.

Bruffee, K.A. (1985). *A short course in writing.* Boston: Little, Brown.

A very applied short text on using Collaborative Learning in the teaching of college writing. Useful for faculty teaching writing, and for college faculty in other disciplines as well. Highly recommended.

Collier, G. (Ed.). (1983). *The management of peer-group learning: Syndicate methods in higher education.* Guildford, Surrey: Society for Research into

Higher Education Ltd.

A collection of chapters written by authors from postsecondary institutions and focusing on small group instruction at the college level.

Cooper, J.L., Sanchez, P., Prescott, S., & Lawrence, T. (1988, April). *Cooperative learning and college instruction: Part II. Paper presented at the meeting of the Western Psychological Association, San Francisco, CA.*

A set of handouts which describe the characteristics of Cooperative Learning, positive outcomes associated with the use of the technique and a description of three applications of the technique by professors in different content areas. Also contains a summary of student perceptions (N = 400+) concerning the efficacy of the technique, indicating that students feel that Cooperative Learning improves higher level thinking skills, general academic achievement and quality and frequency of student-student interactions when compared with traditional forms of college instruction.

DiPardo, A., Warshauer-Freedman, S. (1988). Peer response groups in the writing classroom: Theorectic foundations and new directions. *Review of Educational Research, 58,* 119-149.

As noted in their abstract, this article "examines the pedagogical literature on response groups, places the literature in the context of current theories of teaching and learning of writing, and then examines the small number of studies of peer response groups." Suggests moving away from teacher-controlled response groups to student-centered peer talk during the writing process.

Feichtner, S.B., & Davis, E.A. (1984-5). Why some groups fail: A survey of students' experiences with learning groups. *The Organizational Behavior Teaching Review, 9*(4), 58-71.

A description of good and bad Collaborative Learning procedures in college settings. Very practical.

Feichtner, S.B., & Michaelsen, L.K. (1984). Giving students a part in the process: An innovative approach to team learning. *College Student Journal, 18,* 335-344.

A general description of team learning using heterogeneous groups of six or seven.

Gere, A.R. (1987). *Writing groups: History, theory, and implications.* Carbondale: Southern Illinois University Press.

A short book containing good chapters concerning theories of Collaborative Learning and theories of language development. The language development chapter includes a good comparison of Piaget and Vygotsky's approaches to language acquisition and cognitive development. (Vygotsky is a pivotal figure in the history of Collaborative/Cooperative Learning). Excellent bibliography with brief commentaries on citations.

Hanson, P.G. (1981). *Learning through groups: A trainer's basic guide.* San Diego, CA: University Associates.

A general overview of group learning techniques from the standpoint of a human relations trainer.

Hawkins, T. (1976). *Group inquiry techniques for teaching writing.* Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills and National Council of Teachers of English. (ERIC Document Reproduction Service No. ED 128 813)

A monograph describing a team learning approach to the teaching of collegiate writing. Author cites the experiential learning principles of Carl Rogers extensively, as well as the earlier work of Kenneth Bruffee in Collaborative Learning. Quite practical.

Johnson, D.W., & Johnson, R.T. (1987). *Learning together and alone: Cooperative, competitive, and individualistic learning* (2nd ed.). Englewood Cliffs, New Jersey: Prentice-Hall.

A good overview of Cooperative Learning from researcher/practitioners who have done much of the landmark work in Cooperative Learning. Focus is on practical applications at the precollegiate (K-12) level, but ample discussion of generic principles applicable at all levels. Recom-

mended for all practitioners seeking an overview of research and practice in Cooperative Learning.

Johnson, D.W., Johnson, R.T., & Smith, K.A. (1986). Academic conflict among students: Controversy and learning. In R.S. Feldman (Ed.), *The social psychology of education: Current research and theory* (pp. 199-231). Cambridge: Cambridge University Press.

A textbook chapter which describes a specific form of Cooperative Learning known as structured controversy. In structured controversy, different members of the same learning team assume different positions concerning an issue in an attempt to ultimately maximize learning for all team members through discussion and research relating to the differing positions. Authors conclude that this technique sparks conceptual conflict within students, creates epistemological curiosity and promotes higher-level thinking skills.

Johnson, R.T., Johnson, D.W., & Smith, K.A. (1988).

Cooperative learning: An active learning strategy for the college classroom. Unpublished manuscript. University of Minnesota. A brief description of several Cooperative Learning techniques which may be used in college settings, apparently based on applications in the authors' own classes. Problems with traditional lecture procedures are described. Recommended.

Krayer, K.J. (1986). Implementing team learning through participative methods in the classroom. *College Student Journal, 20,* 157-161.

This article describes five evaluation procedures which may be used in classes using team learning. A rather complicated set of procedures which may be difficult to implement.

McEnerney, K. (in press). Cooperative learning as a strategy in clinical laboratory science education. *Clinical Laboratory Science.*

Describes the features of Cooperative Learning and how CL can be applied in a college classroom. Although Clinical Science is the course content used in this paper, the information presented can be generalized to a variety of academic disciplines. Very practical. Recommended.

Michaelsen, L., Watson, W.E. & Sharder, C.B. (1984-5). Informative testing – a practical approach for tutoring with groups. *The Organizational Behavior Teaching Review, 9*(4), 18-33.

A description of a collegiate Collaborative Learning technique, using organizational behavior as a framework. Focus is on the use of criterion-referenced testing to diagnosis and remediate students' learning.

Radebaugh, M.R. & Kazemek, F.E. (1989). Cooperative learning in college reading and study skills classes. *Journal of Reading, 32,* 414-418.

This short article describes how Cooperative Learning can be implemented in a college study skills class. Focus is on literacy as a social construct. The Cooperative Learning techniques described may be applied to many academic disciplines and courses.

Slavin, R., Sharan, S., Kagan, S., Hertz-Lazarawitz, R. Webb, C., & Schmuck, R. (Eds.). (1985). *Learning to cooperate, cooperating to learn.* New York: Plenum Press.

A compilation of chapters dealing with research and practice in Cooperative Learning. Chapter authors are some of the leading researchers/practitioners in the field. Focus is on precollegiate level. Chapters within the text are based on presentations made at the second meeting of the International Association for the Study of Cooperation in Education. Text can as easily be listed under the "Primarily Research" category of this bibliography, as with several other citations in this section.

Smith, K.A. (1984). Structured controversies. *Engineering Education, 74,* 306-309.

An application of Cooperative Learning techniques to collegiate engineering courses. Of interest to those teaching at the collegiate level in any discipline. Recommended.

Treisman, U. (1985). A study of the mathematics performance of black students at the University of California, Berkeley (Doctoral dissertation, University of California, Berkeley, 1986). *Dissertation Abstracts International, 47,* 1641-A.

A description of Treisman's important research concerning Collaborative Learning with minority math and science students at Berkeley. Black students enrolled in his enrichment program received significantly higher grade point averages in freshman calculus, graduated in math-based majors four times more often, and had significantly lower attrition rates than comparable black students not enrolled in the program. Treisman's model now used at a number of colleges in math, science and engineering programs, with minority and other students. Call or write Treisman for materials or sites near you using the technique.

Wales, C.E. & Stager, R.A. (1977). *Guided design.* Morgantown, WV: University Center for Guided Design.

A good general introduction to Guided Design, a technique for teaching problem solving. Typically, teams of students are led to the solution of complicated problems through a series of structured steps, designed by the teacher.

Wiener, H.S. (1986). Collaborative learning in the classroom: A guide to evaluation. *College English, 48,* 52-61.

A description of the teacher's role in setting up college courses using Collaborative Learning. Recommended.

Whipple, W. (1987). Collaborative learning: Recognizing it when we see it. *American Association for Higher Education, 40*(2), 3-7.

A short overview paper offering characteristics of Collaborative Learning from Bill Whipple, who chairs AAHE's Collaborative Learning Action Community (CUE).

Primarily Research Works

Dansereau, D.F. (1983). *Cooperative learning: Impact on acquisition of knowledge and skills.* (Report No. 586). Fort Worth, TX: Texas Christian University, U.S. Army Research Institute for the Behavioral and Social Sciences. (ERIC Document Reproduction No. ED 243 088)

College students attempting to master and retain information from a science text were placed into different treatment groups. In one group students worked alone; in another group, students worked in pairs. Results indicated that working in pairs was consistently more effective than working alone. Article also discusses effect of role played within pair (active recaller of information versus person listening – the former learned more). Learning style (field dependent/independent) was also examined.

Fraser, S.C., Diener, E., Beaman, A.L. & Kelem, R.T. (1977). Two, three, or four heads are better than one: Modification of college performance by peer monitoring. *Journal of Educational Psychology, 69,* 101-108.

A study in which students were paired with either one, two or three peers. Such groupings were compared with students working individually. Results indicated that those in groups of any size received higher course grades than those working alone.

Frierson, H.T. (1986). Two intervention methods: Effects on groups of predominantly black nursing students' board scores. *Journal of Research and Development in Education, 19,* 18-23.

A study of 139 nursing students who attended a predominantly black southern state college. Students studying cooperatively for the exam and who also received instruction in test taking strategies received higher state board exam scores than nursing students who received either no intervention or who received just test taking strategies instruction.

Hillocks, G., Jr. (1984). What works in teaching composition: A meta-analysis of experimental treatment studies. *American Journal of Education, 93,* 133-170.

A meta-analysis which emphasized modes of instruction (e.g., presentational or

teacher led vs. natural process vs. environmental) and focus of instruction (e.g., grammar vs. free writing vs. inquiry emphasis, etc.). Author concluded that the environmental approach to teaching composition was substantially superior to presentational or natural process (the latter approach emphasized free writing, writing for peers and opportunities for revision). The environmental approach emphasized specific objectives, materials and problems selected to engage students with each other concerning specific aspects of writing, and small group, problem-centered activities and discussions.

Johnson, D.W., Maruyama, G., Johnson, R.T., Nelson, D., & Skon, L. (1981). Effect of cooperative, competitive and individualistic goal structures on achievement: A meta-analysis. *Psychological Bulletin, 89,* 47-62.

Classic meta-analysis in the Cooperative Learning literature. A review of 122 studies (largely K-12) which compared the effect of cooperative, competitive and individualistic goal structures in promoting student achievement and productivity. Results of the meta-analysis indicated that cooperation was considerably more effective than competitive or individualistic goal structures. Potential mediating variables accounting for the results were described.

Newmann, F.M., & Thompson, J.A., (1987). *Effects of cooperative learning on achievement in secondary schools: A summary of research.* Madison: University of Wisconsin, National Center on Effective Secondary Schools.

A summary of twenty-seven high quality studies concerning Cooperative Learning and student achievement at the secondary level. The authors found that Cooperative Learning had higher success rates in mathematics and language arts (vs. other academic content areas) and that cooperative techniques like Students Teams Achievement Division, Teams Games Tournaments, Learning Together and Group Investigation had higher success rates than jigsaw.

Shaw, M.E., Ackerman, B., McCown, N.E., Worsham, A.P., Haugh, L.D., Gebhardt, B.M., & Small, P.A., Jr. (1979). Interaction patterns and facilitation of peer learning. *Small Group Behavior, 10,* 214-223.

A study conducted on first year medical and dental students enrolled in an immunology course. The authors found that group members who gave information to peers in their small groups were perceived as facilitating group performance. However, group members asking for information were more important in actual facilitation of group learning, based on Bales method for interaction process analysis.

Slavin, R.E. (1983). When does cooperative learning increase student achievement? *Psychological Bulletin, 94,* 429-445.

Slavin, in a meta-analysis which required more stringent criteria for inclusion in the analysis than did Johnson et. al. (1981), found that in 46 field experiments at the K-12 level, Cooperative Learning produced greater achievement than control treatments in 29 studies, and that control treatments produced greater achievement in two studies.

Sherman, L.W. (1986). Cooperative versus competitive educational psychology classrooms: A comparative study. *Teaching and Teacher Education, 2,* 283-295.

One of the few well controlled, empirical studies of Cooperative Learning at the college level. Sherman taught educational psychology classes using three conditions. In one condition, students were taught competitively, using no team learning and norm referenced grading. In another condition, students were taught to cooperate within their learning teams but the teams competed for points with other teams (using Slavin's STAD technique). In the third condition, students cooperated within their teams and there was no inter-team competition for grades. No significant achievement differences were found between the three conditions. Affective posttest measures tended to favor the cooperative conditions rather

than the individually competitive conditions.

Tjosvold, D., & Field, R.H.G. (1984). Effect of concurrence, controversy and consensus on group decision making. *The Journal of Social Psychology, 125*, 355-363.

A study in which 78 collegiate business students were instructed to seek concurrence, controversy or consensus within small groups. The controversy approach seemed to be a more reliable way to explore an issue when compared to the other two approaches. Results indicated that group members who had conflicting opinions and encouraged controversy were more curious about a problem and explored the problem in-depth, but, despite this cognitive conflict they did not make high-quality decisions.

*Since most of the Cooperative Learning work has been done at the K-12 level and has application to older learners, a limited number of these precollegiate works have been included. A number of works which appear to be compatible with Cooperative Learning have also been included, such as a limited number of Collaborative Learning, Organizational Behavior and Guided Design citations. We do not claim that this is an exhaustive listing of research or practice in any of the areas named above. We welcome additions and amendments to this listing. If you have such suggestions, please send them to Jim Cooper (Office of Faculty Development, CSUDH, Carson, CA, 90747; or call 213-516-3961) and they may be included in succeeding drafts of this "work in progress".

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Cooperative/Collaborative Learning: Part II

An annotated bibliography for the SPOD practitioner on cooperative/collaborative learning research and practice (primarily) at the college level.

By James Cooper, Molly McKinney & Pamela Robinson*

Cooperative Learning (CL) may be defined as a structured, systematic instructional strategy in which small groups work together toward a common goal. CL differs from other small-group and Collaborative Learning approaches in its emphasis on highly structured techniques for ensuring positive interdependence within groups and its insistence on individual accountability (rather than undifferentiated group grading). Persons interested in examining the differences between CL and other forms of small-group work may wish to read the Slavin, Cooper and Millis works cited in the bibliography. Research, largely at the precollegiate, level suggests that many forms of small-group work can influence students attitude towards school, towards other students, and a variety of other attitudinal measures. According to Slavin (1988), however, in order to have an impact on achievement small group teaching procedures must include positive interdependence and individual accountability, features which characterize CL.

When Jim Eison asked Jim Cooper to submit his annotated bibliography on Cooperative Learning (CL) and higher education to *JSPOD* in the Spring of 1989, there were relatively few studies reported using CL at the college level. Although over 600 studies of CL had been completed at the precollegiate level as of 1989, a CD ROM search of ERIC under the descriptor of "Cooperative Learning and Higher Education" produced no citations in 1982 and 1983, three citations in 1984, eight in 1985, four in 1986 and five in 1987. In 1988 the number of citations jumped to 15, then in 1989 and 1990 there were 37 citations for each of these two years. Since ERIC does not list all journal articles and other sources of research and practice these numbers are certainly an underestimate of the actual number of works concerning CL and college teaching. However, the numbers do suggest the substantial growth in interest in CL within higher education over the last two or three years (about 15 years after the K-12 sector had been successfully applying the technique).

Because of the significant increase in

*The authors would like to acknowledge the extraordinary assistance provided by Gail Cook and the other librarians at California State University Dominguez Hills in the preparation of this bibliography. Preparation of this bibliography was made possible, in part, by a grant from the Fund for the Improvement of Post Secondary Education (FIPSE).

interest in CL at the college level, and the large number of published reports on this topic since publication of the 1989 *JSPOD* annotated bibliography (Number 7, pages 143-148), we have compiled the following list of applied and research works, none of which appeared on the 1989 bibliography.

We have included a number of works which deal with Collaborative Learning and other forms of small-group work in higher education. Future research will determine whether the distinction between Cooperative Learning and other forms of small-group work is a meaningful one in terms of its effects on student cognitive and attitudinal outcomes in higher education. We do not pretend that this listing or the 1989 bibliography are exhaustive. We urge others who know of additional work in CL and higher education to contact Jim Cooper at CSU Dominguez Hills, Carson, CA, 90747 (Tel. 213-516-3916). Jim currently has a FIPSE grant to study the effects of CL on college students at both two-year and four-year colleges. Part of the grant includes a dissemination function which involves publishing a complimentary newsletter containing tips on implementing CL and research briefs relating to CL and college teaching. Interested persons may contact Jim to be placed on the data base and receive the newsletter and other CL materials.

The following bibliography is divided into two parts. The first part deals with studies which detail techniques for implementing Cooperative Learning and Collaborative Learning within college classrooms. The second section deals with research and theory issues concerning CL and higher education.

Primarily Applied Works

Bishop, W. (1986). *Research, theory, and pedagogy of peer writing groups: An annotated bibliography.* Fairbanks: University of Hawaii. (ERIC Document Reproduction Service No. ED 276 035)

Must reading for those interested in Collaborative Learning and college composition. The annotations are particularly detailed and insightful. Useful to anyone interested in collaborative or cooperative techniques at the college level.

Bruffee, K. A. (1978). The Brooklyn plan: Attaining intellectual growth through peer-group tutoring. *Liberal Education, 64*(4), 447-468.

An excellent critique of the Brooklyn plan of peer tutoring. Even though this is not CL, it shows the effects of peer influence on the means, power and criteria by which we make decisions and identifies the personal biases one brings to group situations. This critique tells how large commuter colleges and universities can tap into peer group influence and use it to produce college graduates who are critical thinkers and evaluators. The Brooklyn plan uses peer evaluation and criticism as a tool to improve writing skills. The overall results of the program show that the students who participated not only learned how to evaluate and make critical judgments about the work of others, but also learned how to use these skills in their own works.

Chickering, A. W., Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 3-7.

A report published by AAHE identifying principles of good practice in undergraduate education. Among the principles identified are active learning, cooperation

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among students and frequent contact between faculty and students. [See Research and Theory Section, Millis, 1991]

Cooper, J. L. (1990, May). Cooperative learning and college teaching: Tips from the trenches. *The Teaching Professor, 4*(5) p. 1,2.

A 750-word newsletter article with useful tips on implementing Cooperative Learning across the disciplines. A good sample for those interested in small-group instruction but having difficulties in implementing the techniques. More details on the issues described briefly in this article can be found in Cooper & Mueck and Cooper et. al.

Cooper, J.L., & Mueck, R. (1990). Student involvement in learning: Cooperative learning and college instruction. *Journal on Excellence in College Teaching, 1,* 68-76.

An article which describes the critical features of Cooperative Learning and how it differs from traditional small group teaching techniques. Other sections of the paper deal with student outcomes affected by Cooperative Learning, including data collected on over 1000 students enrolled in 18 different courses at an urban, multicultural campus. A good general introduction to CL at the college level. Highly recommended.

Cooper, J.L., Prescott, S., Cook, L., Smith, L., Mueck, R., & Cuseo, J. (1990). *Cooperative learning and college instruction: Effective use of student learning teams.* Carson, CA: California State University Foundation on Behalf of the California State University Institute for Teaching and Learning.

A 50-page workbook designed for college instructors interested in incorporating Cooperative Learning into their courses with minimal disruption to existing teaching formats such as lecture and lecture-discussion. Among the topics treated are the benefits of using Cooperative Learning, critical features, organizing the classroom, trouble-shooting problems in implementation, and tips on getting started in Cooperative Learning. Very practical.

DeZure, D. (1989). Matching classroom structure to narrative technique: Using "jigsawing" to teach *Ordinary People,* a multi-perspective novel. *CEA Forum, 19*(3-4), 17-20.

DeZure describes a specific form of CL known as Jigsaw and how she uses it to teach text deconstruction through analysis of narrative voice. She describes in detail how she uses the technique in a literature class considering the novel *Ordinary People* (although she argues for its applicability in a range of English and humanities classes). Highly recommended for literature and humanities faculty.

Duin, A. H. (1984, May). *Implementing cooperative learning groups in the writing curriculum: What research shows and what you can do.* Paper presented at the Annual Meeting of the Minnesota Council of Teachers of English, Mankato, MN. (ERIC Document Reproduction Service No. ED 251 849)

An article which describes key features of CL and briefly reviews some of the cooperative/collaborative research in writing. The primary focus is on the author's prior approach to teaching writing and tips on implementing CL in a college writing class. A number of sample CL exercises are included in the appendix. Recommended.

Gabelnick, F., MacGregor, J., Matthews, R. S., & Smith, B. L. (1990). Learning communities: Creating connections among students, faculty, and disciplines. In R. E. Young (Ed.), *New Directions For Teaching and Learning, 41.* San Francisco: Jossey-Bass.

An excellent source which describes a number of learning communities. Among the issues treated are the history of learning communities, faculty and student perspectives and curriculum issues relating to the subject. The last chapter describes a variety of resources for those wishing to find out more about learning communities. Recommended.

George, D. (1984). Working with peer groups in the composition classroom. *College Composition and Communication, 35*(3), 320-326.

George has taped over 100 peer-group sessions in college-level composition classes. She identifies three major descriptive categories for the groups: task-oriented, leaderless and dysfunctional. George offers suggestions concerning how to get ineffective groups to function better, including recapitulation, taping, and having the students identify problem areas in the papers as a vehicle for discussion.

Glidden, J. & Kurfiss, J. G. (1990). Small group discussion in philosophy 101. *College Teaching, 38*(1), 3-8.

A well-written article describing the effects of Collaborative/Cooperative Learning in two different philosophy classes. Authors report that group work was generally equal to or superior to the traditional instructional format which was used as a comparison group. Some interesting practical applications of small group work on philosophical questions are described. Of special interest to persons in philosophy and the humanities. Recommended.

Graves, N. & Graves, T. (Eds.). *Cooperative Learning.*

A magazine for researchers and practitioners interested in Cooperative Learning. Although primarily concerned with precollegiate research and practice, the magazine is of great interest to college-level teachers. Each issue contains articles dealing with theory and practice plus announcements of conferences, book reviews and controversies within the CL community. Persons interested in subscribing may contact Drs. Nancy & Ted Graves, 136 Liberty Street, Santa Cruz, CA 95060 Tel. (408) 429-6550.

Hvitfield, C. (1986, November). *Guided peer critique in ESL writing at the college level.* Paper presented at the Annual Meeting of the Japan Association of Language Teachers International Conference on Language Teaching and Learning, Seirei Gakuen, Hamamatsu, Japan. (ERIC Document Reproduction Service No. ED 282 438)

An anecdotal description of Collaborative Learning in an ESL composition class in Malaysia. The author asserts that peer critiques works best for the student giving the critique versus receiving the critique, a finding consistent with several other studies.

Jacobs, G. & Ilola, L. M. (1990, April). *Disagreement can be inviting: A cooperative learning approach.* Paper presented at the Annual Meeting of the American Educational Research Association, Boston. (ERIC Document Reproduction Service No. ED 319 738)

The authors describe a form of CL known as structured controversy. In struc-

tured controversy pairs of students within four-person teams develop arguments favorable to their position, then present these arguments to the other pair who have researched a different position on the topic. Pairs then switch positions. The purpose of the exercise is not to win a debate but to adduce as much information as possible. The present authors compared structured controversy to a debate format in teaching a multicultural education class. In most comparisons the data collected yielded non-significant differences. Significant findings favored the CL technique over the debating procedure. Practical examples of structured controversy are clearly presented.

Johannessen, L. R. (1988, November). *Teaching strategies for interpreting and writing about literature.* Paper presented at the Annual Meeting of the National Council of Teachers of English, St. Louis, MO. (ERIC Document Reproduction Service No. ED 311 454)

This article describes a variety of practical strategies for incorporating Collaborative Learning in the teaching of literature. Recommended.

Johnson, D. W., & Johnson, R. T. (1987). *Learning from colleagues: Cooperation among adults.* Unpublished manuscript. University of Minnesota.

A manuscript in which the Johnson brothers describe the data concerning cooperative versus competitive and individualistic teaching approaches among adults. They conclude in their meta-analysis that CL is superior to the other two approaches on achievement, interpersonal relations, social support and self-esteem. Tips on using CL in bringing about change in teaching behavior within institutions are addressed.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1991). *Active learning: Cooperation in the college classroom.* Edina, MN: Interaction Book.

An excellent workbook which provides a wealth of practical information concerning CL and college teaching. This is the book to buy if you only purchase one source of information on the subject. Highest recommendation.

Kelly, P. R. & Farnan, N. (1990). Practicing what we teach in reading education programs. *Journal of Reading, 33*(4), 264-269.

The authors describe a variety of active learning strategies that they use in their classes (in conjunction with CL). The article contains many useful tips on getting students more actively involved both in class and in their homework assignments. Recommended for all teachers.

Long, G. A. (1989). Cooperative learning: A new approach. *Journal of Agricultural Education, 30*(2), 2-9.

An article which describes a variety of CL techniques such as STAD, Jigsaw I and II, as well as team building and other elements of CL. The focus is on university level agricultural classes but the techniques can be applied in a variety of college level disciplines. Recommended as a brief overview of a number of CL practices.

Lyons, P.R. (1989). *Cooperative and workplace learning approaches.* Frostburg, MD: Frostburg State University, Center for Management Development. (ERIC Document Reproduction Service No. ED 310 657)

Describes three cooperative/collaborative approaches and a rationale for why such techniques are appropriate for adults. The three techniques are

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Coop/Coop, Group Investigation and Reiterative Problem Solving.

Manera, E. S. & Glockhamer H. (1988-89). Cooperative learning: Do students "own" the content? *Action in Teacher Education, 10*(4), 53-56.

The authors briefly describe applications of CL to the teaching of ESL, humanities and teacher education. Descriptions are sketchy.

Marks, M. (1991). *Cooperative learning in chemistry.* College Park, MD: Center for Teaching Excellence.

A report describing the process of designing and implementing Cooperative Learning in an honors chemistry class at a university. The paper reports favorable results from questionnaires administered to the students regarding attitudes about CL, and has some of the dialogue from student interviews about the CL techniques used in the class. This honors chemistry class had a higher average on a final exam that was also administered to a regular section of chemistry and another honors section not using CL techniques. The instructors were also interviewed and said that CL "keeps the students involved", and that they do not teach but "provide a way for students to learn."

Mattila, L. (1990). *Using cooperative learning groups in teaching computer science.* Unpublished manuscript.

A very brief report describing the application of CL to a community college computer science class. Very applied. Mattila can be reached at Minneapolis Community College in the Computer Science Department.

McDougall, K., & Gimple, D. (1985, November). *Cooperative learning strategies for teaching small group communication: Research and application.* Paper presented at the Annual Meeting of the Speech Communication Association, Denver, CO. (ERIC Document Reproduction Service No. ED 271 800)

A description of the use of Jigsaw in community college small-group communication courses.

McNeil, L. D. (1990, March). *Say it again Sam: Recursive writing and critical thinking in the literature classroom.* Paper Presented at the Annual Meeting of the Conference on College Composition and Communication, Chicago. (ERIC Document Reproduction Service No. ED 318 028)

McNeil critiques some of the traditional techniques for fostering critical thinking in college composition and literature classes, including the use of journals/logs. She argues, that to induce critical thinking in students taking these classes, certain elements identified by psychologists must be present. Among her recommendations for teaching these classes are the use of student "dialogue folders" where on-going dialogues with the text, themselves and with peers are recorded and reflected on. She argues for Cooperative Learning groups with clearly defined roles (an adversary, a sympathizer, a caretaker, a recorder and a librarian). Recommended.

Millis, B. J. (1990). Cooperative learning strategies for continuing education faculty. In M. C. Natelli & T. F. Kowalik (Eds.), *Continuing Education: A Critical Reflection. Proceedings of the 1990 Annual Conference of Region II, National University Continuing Education Association* (pp. 41-49). Binghamton, NY: National University Continuing Education Association. (ERIC Document Reproduction Service No. ED 324 455)

Millis outlines the critical features of CL and relates CL to characteristics of the adult learner. She also outlines a number of specific CL procedures. Highly recommended.

Millis, B. J. (1991). Helping faculty build learning communities through cooperative groups. In L. Hilsen (Ed.), *To Improve the Academy: Resources for Student, Faculty, and Institutional Development* (pp. 43-58). Stillwater, OK: New Forums Press.

An excellent source describing a variety of CL techniques at the college level. Although research support is cited, the focus is on very practical applications of CL across all disciplines. Highly recommended for new practitioners as well as more experienced users.

Murdick, W. & Grinstead, R. (1989, October). *Using collaborative writing pedagogy in the art classroom.* Paper presented at the West Virginia Art Education Association Fall Conference, Shepherdstown, WV. (ERIC Document Reproduction Service No. ED 311 467)

The authors use the work of Thomas Kuhn in science and Ken Bruffee in composition to argue for using Collaborative Learning in college art classes. They describe the collaborative techniques that they used in a beginning drawing class and illustrated the effect of art students' collaborations using actual drawings. Highly recommended for art teachers.

O'Donnell, A. & Adenwalla, D. (1989, July). Scripted cooperation and knowledge maps: Information processing tools applied to deaf education. In: D. Martin (Ed.), *International Symposium on Cognition, Education, and Deafness, 2* (pp. 836-854). Washington, DC. (ERIC Document Reproduction Service No. ED 313 849)

O'Donnell and Adenwalla describe the uses of "scripted" Cooperative Learning and the use of knowledge mapping. Scripted cooperation is a method for structuring CL which uses student pairs. Students alternate roles as recaller of information and checker of the correctness of the recall. Both members of the dyad attempt to construct elaborative and other metacognitive strategies to assist retention. In knowledge mapping information is presented in two-dimensional representations. Idea units are connected to other ideas using a series of links in order to render relationships more explicit to the teacher and students. Both scripted cooperation and knowledge mapping are potentially powerful metacognitive additions to CL which should be considered by CL practitioners interested in enhancing long-term retention and critical thinking. Highly recommended.

Olmstead, J. A. (1974). *Small group instruction: Theory and practice.* Alexandria, VA: Human Resources Research Organization.

Although this volume is now somewhat dated, it presents succinct descriptions of research and practice with small-group teaching techniques. Practical instructions for implementing nine small

group techniques are outlined, including case discussion, buzz sessions, and conference method (but not Cooperative Learning).

Rau, W., & Heyl, B. S., (1990). Humanizing the college classroom: Collaborative learning and social organization among students. *Teaching Sociology, 18,* 141-155.

An excellent article on using Collaborative Learning in college sociology classes (although the information presented can be applied across many disciplines). One portion of the article deals with implementation issues. The other portion presents data indicating that material learned collaboratively was retained more than material studied individually. Authors also report positive effects of collaborative instruction on student-student connections and indicate strong student liking for Collaborative Learning.

Roth, W. (1990, April). *Collaboration and constructivism in the science classroom.* Paper presented at the Annual Convention of the American Educational Research Association, Boston, MA. (ERIC Document Reproduction Service No. ED 318 631)

Roth argues that knowledge is a social construction and is "shared through social transactions in a community of knowers, rather than being descriptive of an absolute, knower-independent reality." He then describes his basic beliefs and central metaphors which he uses in the teaching of science. The last section of this conference paper describes specific collaborative procedures Roth uses in the teaching of physics, including Collaborative Learning and cognitive mapping. This paper is of particular interest to those teaching in the physical sciences.

Ryan, M. A., Robinson, D., & Carmichael, JW, Jr. (1980). A Piagetian-based general chemistry laboratory program for science majors. *Journal of Chemical Education, 57,* 642-645.

Describes a chemistry program at a historically black college based on the principles of Collaborative Learning and Piaget. Data focus is on a chemistry lab taught using a Piagetian/collaborative approach versus a more traditional approach. Authors conclude that students performed equally well on a "skills-based" final exam but that experimental-group students performed better on a Piagetian-like test, rated course higher on a post-course evaluation and had better attendance.

Sheridan, J.; Byrne, A. C.; Quina, K. (1990). Collaborative learning: Notes from the trenches. *College Teaching, 37*(2), 49-53.

A short article describing a Collaborative Learning (ClL) project at the College of Continuing Education University of Rhode Island for faculty members wanting to learn how to implement ClL in their classrooms. The article gives examples of applications in specific disciplines ranging from zoology to English. The authors also list the benefits and weaknesses of ClL and give strategies for "successful collaboration."

Smith, K. A. (1986). Cooperative learning groups. In S. F. Schomberg (Ed.), *Strategies for active teaching and learning in university classrooms* (pp. 18-26) Minneapolis, MN: University of Minnesota.

An excellent chapter on how to get started using CL at the college level. Includes applications of CL in two college engineering classes. Recommended for teachers within all disciplines.

Steffens, H. (1989). Collaborative learning in a history seminar. *The History Teacher, 22*(2), 125-138.

Steffens describes a variety of Collaborative Learning techniques designed to accomplish two objectives in his upper-division history seminar. One set of techniques increased the amount of active involvement of students during in-class discussions. The other set of procedures increased the level of collaboration in the writing of term papers. Lots of good tips on implementation for instructors teaching seminar classes, especially in the humanities.

Whitman, N. A. (1988). *Peer teaching: To teach is to learn twice* (ASHE-ERIC Higher Education Report No. 4) Washington, DC: Association for the Study of Higher Education.

An excellent short book which describes five major approaches to peer teaching and summarizes the empirical support for each. The techniques described include the use of teaching assistants, tutors, and counselors within and outside of the classroom. Student partnerships and student work-groups which closely approximate the critical features of Cooperative Learning are described. Text includes a good reference section.

Primarily Research and Theoretical Works

Annis, L. F. (1983). The processes and effects of peer tutoring. *Human Learning, 2*(2), 39-47.

A short-term empirical study comparing various forms of Collaborative Learning to individual studying. Findings were that tutoring produced greater achievement than being tutored, and that preparing to teach combined with actual teaching produced higher achievement scores than just preparing to teach. Author attributes findings to a three-step learning model: a) paying attention to material, b) encoding material in a personally meaningful way, and c) associating material with what is already known.

Bansangue, M. (1991, January). *Achievement effects of collaborative learning in introductory statistics: A time series residual analysis.* Paper presented a the Joint Annual Meeting of the Mathematical Association of America/The American Mathematical Society, San Francisco.

A study showing the benefits of Collaborative/Cooperative Learning in an introductory statistics class. Comparison of control and experimental treatment groups showed no difference on the first examination but significant differences in favor of the experimental group at measurement points thereafter. The study found evidence to support Collaborative/Cooperative Learning as a useful alternative teaching method in mathematics.

Barbour, D. H. (1990). Collaborative writing in the business writing classroom: An ethical dilemma for the teacher. *The Bulletin of the Association for Business Communication, 53*(3), 33-45.

The author makes the case that collaborative writing is an accepted practice in the business community but that he has had ethical concerns with Collaborative Learning. The concerns largely focus on giving undifferentiated group grades for a team project/product. The solutions to these concerns suggested by Barbour include techniques long identified with Cooperative Learning, including individual accountability, group processing of each member's contribution, and assigning roles to team members.

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Benware, C. A., & Deci, E. L. (1984). Quality of learning with an active versus passive motivational set. *American Educational Research Journal, 21,* 755-765.

Not a study of Cooperative or Collaborative Learning. Included here for its possible impact in explaining why CL may be more effective than individual learning. College students were randomly assigned a homework reading with the expectation that they would either be tested on content or teach content to another student. Subjects expecting to teach content scored higher in a posttest of conceptual understanding of homework, and on intrinsic motivation. No differences were found between groups concerning rote recall of homework material. Bergh and Schul (1980) found similar results in comparing students who expected to teach others versus studying for their own learning.

Carrier, C. A. & Sales, G. C. (1987). Pair versus individual work on the acquisition of concepts in a computer-based instructional lesson. *Journal of Computer-Based Instruction, 14*(1), 11-17.

A very short-term study in which concept formation taught via computer-assisted instruction was compared for college students learning the information in pairs or individually. Although the pairs scored higher on an immediate posttest and a retention test given one week later, the differences were not statistically significant. The paired students asked for more elaborate feedback from the computer.

Carroll, D. W. (1986). Use of jigsaw technique in laboratory and discussion classes. *Teaching Psychology, 13,* 208-210.

A greatly modified version of Aronson's Jigsaw classroom was assessed in a one-group evaluation design. Students were taking a one-unit upper division psychology course. Author reports that Jigsaw allows students to learn material efficiently while improving social skills.

Dansereau, D. F. (1987). Transfer from cooperative to individual studying. *Journal of Reading, 30*(7), 614-619.

In this article, Dansereau contributes to the theory of CL by distinguishing CL (in which students read the same material and intermittently discuss what they have learned) from Cooperative Teaching (in which students read different material and take turns teaching it to one another). He asserts that Cooperative Teaching leads to better initial learning but CL leads to better transfer to individual learning. This is an important distinction in comparing various types of CL such as Jigsaw and STAD. Also included are comments on the role of elaboration and metacognition in CL. Recommended.

Dansereau, D. F. (1988). Cooperative learning strategies. In C. E. Weinstein, E. T. Goetz, & P. A. Alexander (Eds.), *Learning and study strategies: Issues in assessment, instruction, and evaluation* (pp. 103-120). New York: Academic Press.

A chapter which summarizes several short-term studies concerning aspects of Cooperative Learning techniques at the college level. Dansereau reports that: a) cooperative dyads outperform individuals in learning scientific text materials, b) active listening is more effective than passive listening in cooperative situations, c) metacognitive activities are more effective for initial acquisition of material but elaborative activities are more effective for transfer, and d) dyads who are heterogeneous with respect to cognitive style and verbal ability outperform homogeneous pairs. Dansereau and his collegues have publish-

ed many articles concerning CL at the college level.

Haines, D. B., & McKeachie, W. J. (1967). Cooperative versus competitive discussion methods in teaching introductory psychology. *Journal of Educational Psychology, 58*(6), 386-390.

Haines and McKeachie report that "cooperative and competitive techniques of teaching discussion sections of general psychology were compared with respect to their effects on student anxiety, student achievement, and student satisfaction. The competitive condition resulted in higher tension, poorer achievement in recitation, and less satisfaction than the cooperative condition."

Hall, R. H., Rocklin, T. R., Dansereau, D. F., Skaggs, L. P., O'Donnell, A. M., Lambiotte, J. G., & Young, M. D. (1988). The role of individual differences in the cooperative learning of technical material. *Journal of Educational Psychology, 80,* 172-178.

A very short-term, well-controlled study comparing college students who learned technical material in dyads versus learning individually. Results suggest that there may be interactions in the effect of CL as a function of type of material to be mastered, and individual differences among students. Specifically, CL may produce higher achievement among extroverts relative to introverts. This article raises two long-standing issues: a) Is CL particularly appropriate in learning certain kinds of material? and b) Are certain CL techniques differentially effective for certain kinds of outcome measures?

Houser, N. O. (1990). *Socialization, learner intent, and environmental intellectualism: A transactional model of art education.* (ERIC Document Reproduction Service No. ED 322 043)

A good article about the application of group work in art. The author gives a model to follow and states that teachers should create a safe environment that fosters critical thinking, socialization and openness to ideas. Houser argues that one must learn to support his/her own ideas and yet not reject anyone who opposes them. Houser also "proposes a collaborative processing model for art education that draws upon the language and learning theories of Lev S. Vygotsky. This model is a means by which students' natural affinity for socialization and inclination to attend to their own personal agendas may be used to increase learning motivation and effectiveness." In addition to developing the theoretical model the author identifies a sequence of steps to be used in a studio art setting. Highly recommended.

Johnson D. W. & Johnson R. T. (1989). *Cooperation and competition: Theory and research.* Edina, MN: Interaction Book.

A research summary which describes the impact of CL on a variety of outcome measures. Results are reported separately for subjects of varying ages/grades (grades 1 through college and adult). Meta-analysis techniques are used to summarize data. Over 600 studies are cited. Must reading for anyone interested in research on CL at any level.

Kacer, B., Rocklin, T., Weinholtz, D. (1990). *Individual versus small group instruction of computer applications: A quantitative and qualitative comparison.* Unpublished manuscript.

A study in which groups of students in a computer applications class were randomly assigned to work either alone or in Cooperative Learning groups. Quantitative measures revealed no difference between the groups on achievement or attitude. Qualitative measures suggested that the CL students engaged in more planning activites and had better conceptual understanding of the content.

King, A. (1990). Enhancing peer interaction and learning in the classroom through reciprocal questioning. *American Educational Research Journal, 27*(4), 664-687.

A report of two well-controlled but brief studies on the nature of questioning in college education classes. The author concludes that students given instruction in reciprocal peer-questioning: a) asked more critical thinking (vs. recall) questions, b) gave more elaborate explanations, and c) received higher scores on achievement tests, than students told simply to discuss a 90-minute lecture. In a second study, students given teacher-guided questions performed better on these same three outcome measures than students who constructed their own questions, following a 60-minute lecture.

Larson, C.O., & Dansereau, D. F. (1986). Cooperative learning in dyads. *Journal of Reading, 29*(6), 516-520.

An interesting article which describes a series of short-term studies of CL at the college level using learning dyads (pairs). Authors report a series of tips concerning good CL practice and a generic exercise for reading a textbook and recalling the content using CL pairs. Recommended.

Lipschultz, J. H. (1990). Group work adds perspective in news, broadcasting classes. *The Journalism Educator, 45*(2), 63-68.

Lipschultz taught two different journalism courses using CL, then assessed student perceptions at the end of the term. Students were generally positive about their experiences although some complained about sandbaggers within their groups.

Magid, A. (1988, April). *Cooperative communication: A study of group interaction.* Paper presented at the Annual Symposium on Developmental/Remedial Education of the New York College Learning Skills Association, 15210 Catskills, NY. (ERIC Document Reproduction Service No. ED 297 797)

A study of small-group instruction in a community college setting. Magid reports largely qualitative data indicating that students in small groups tended to talk and answer more questions when they returned to a traditional lecture/discussion format—relative to students not exposed to small groups. The students experiencing the small-group format received more As and Bs and improved more in their writing skills compared to students not experiencing the small group format; also small group students related better to others of differing ages and to students having learning disabilities.

Millis, B. J. (1991). Fulfilling the promise of the "7 principles" through cooperative learning: Action agenda for the university classroom. *Journal on Excellence in College Teaching. 2,* 139-144.

A good article which indicates how CL

implements the Seven Principles of Good Practice in Undergraduate Education reported by Chickering and Gamson in *The Wingspread Journal* (AAHE). Highly recommended.

Murphy, K. (1990, March). *The discourse analysis of collaborative groups: Exploring the role of gender in conversation.* Paper presented at the Annual Meeting of the Conference on College Composition and Communication, Chicago, IL. (ERIC Document Service No. ED 319 049)

As the author states in her abstract, "Small all-female, all-male, and mixed-gender discussion groups were selected from among freshman composition students to discuss papers which the students had written ... Findings suggest that women's speech seems to be better adapted to task-oriented academic discourse than normal male conversational modes. Academic discussions of the type studied require the sense of cooperation and attention to individual speakers and group tasks that the female patterns provide. However, an androgynous model, which is necessary, also adapts well to peer group interaction."

Rice, S. C. & Gabel, D. L. (1990). *Cooperative learning in a college science course for preservice elementary teachers.* (ERIC Document Reproduction Service No. ED 320 773)

A relatively well-controlled comparison of two college-level science sections taught cooperatively versus two taught more traditionally. No main effect of teaching technique was observed on the dependent variables, which included a variety of attitudinal and cognitive measures.

Sharan, S. (Ed.). (1990). *Cooperative learning: Theory and research.* New York: Praeger.

Although written with K-12 applications in mind, this book is must reading for anyone interested in research, theory and practice in CL. Twelve chapters written by various authors deal with such issues as causal mechanisms and CL, CL and achievement, and a perspective on research and practice in CL. Chapter authors include many of the influential thinkers in the CL community, including Slavin and the Johnsons. Highly recommended.

Shearn, E. & Davidson, N. (1989, March). *Use of small-group teaching and cognitive developmental instruction in a mathematical course for prospective elementary school teachers.* Paper presented at the Meeting of the American Education Research Association, San Francisco.

Two groups of teacher trainees taking an introductory math course were exposed to Cooperative Learning. Cognitive development (based on Perry's model) and students' self concept-increased from pretest to posttest.

Slavin, R. E. (1988). Cooperative learning and student achievement. *Educational Leadership, 46*(2), 31-33.

An article in which Slavin argues that achievement gains associated with Cooperative Learning will only occur if group goals and individual accountability are explicit components of the instructional system.

Slavin, R. E. (1989). Cooperative learning and student achievement: Six theoretical perspectives. In M. Maehr & C. Ames (Eds.), *Advances in motivation and achievement: Motivation enhancing environments* (Vol. 6, pp. 161-177). Greenwich: JAI Press.

An article which attempts to explain

the reasons why certain forms of Cooperative Learning have an effect on achievement and other forms do not. Among the theoretical perspectives treated are motivation, social cohesion, cognition and development. Must reading.

Slotnick, R. S. (1981, August). *Peer support networks in a large introductory psychology class.* Paper presented at the Annual Convention of the American Psychological Association (ERIC Document Reproduction Service No. ED 209 629)

A comparison for two sections of introductory psychology taught with a traditional lecture format versus a team-learning format. The groups using a team format received a lecture on Mondays and Wednesdays, then were given small-group activities on Friday. The small heterogenous groups were formed on the basis of achievement on a quiz given early in the semester. Students in the small-group class achieved more on a variety of course outcome measures and were more positive than the traditionally-taught class on two of the social climate measures. Experimental students also knew names of more of their classmates.

Spurlin, J. E., Dansereau, D. F., Larson, C. O., & Brooks, L. W. (1984). Cooperative learning strategies in processing descriptive text: Effects of role and activity level of the learner. *Cognition and Instruction, 1*(4), 451-463.

A study in which the impact of specific roles and activities on each member of a Cooperative Learning dyad was examined. Results indicated that, on free recall of text information, recallers of text information performed better than those assigned to listen to the recallers. Cooperative dyads using active learning strategies performed better than cooperative dyads not using such strategies.

Totten, S., Sills, T., Digby, A., & Russ, P. (1991). *Cooperative learning: A guide to research.* New York: Garland.

A book of 390 pages in which the authors present annotated bibliographies of the research in CL. Separate chapters contain bibliographies for various types of CL (e.g. Jigsaw, Group Investigation, etc.), subject areas, student outcomes affected by CL (mathematics, science, social skills) and other topics. The authors also present information on films, games, newsletters and organizations associated with CL. An excellent 18-page overview and introduction is also provided. The focus is largely on precollegiate work, reflecting the historical emphasis of CL researchers. Must reading for anyone interested in research on CL (and interesting reading for practitioners wanting to find out more about applications of CL).

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